

Claims

1. An internal combustion engine having a crankshaft, comprising: a locking mechanism coupled to the crankshaft, said locking mechanism allowing crankshaft
5 rotation in one direction only.

2. The engine of claim 1 wherein said locking mechanism comprises a freewheel clutch.

10 3. The engine of claim 2 wherein said freewheel clutch is positioned between a gearbox and the engine.

4. The engine of claim 1 wherein said locking mechanism comprises ratchets that engage with a gear
15 coupled to the crankshaft.

5. An internal combustion engine having a crankshaft, comprising:
a locking mechanism coupled to the crankshaft, said
20 locking mechanism preventing crankshaft rotation.

6. The engine of claim 5 wherein said locking mechanism comprises pins that engage with a gear coupled to the crankshaft.
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7. The engine of claim 5 wherein said locking mechanism comprises ratchets that engage with a gear coupled to the crankshaft.

30 8. The engine of claim 5 wherein said locking mechanism comprises a friction belt that engages with the crankshaft.

9. A method for shutting down an internal combustion engine, comprising:

stopping the engine in a predetermined rest
5 position wherein the predetermined rest position is such that motoring torque is decreasing during the first phase of restart; and

locking the engine in said predetermined rest condition via a locking mechanism.

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10. The method of claim 9 wherein the locking mechanism prevents engine rotation.

11. The method of claim 10 wherein said locking
15 mechanism comprises pins that engage with a gear coupled to the crankshaft.

12. The method of claim 10 wherein said locking
20 mechanism comprises ratchets that engage with a gear coupled to the crankshaft.

13. The method of claim 10 wherein said locking
mechanism comprises a friction belt that engages with the
crankshaft.

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14. The method of claim 9 wherein the locking mechanism allows the engine to rotate in one direction only.

15. The method of claim 14 wherein said locking
30 mechanism comprises a freewheel clutch.

16. The method of claim 15 wherein said freewheel clutch is positioned between a gearbox and the engine.

17. The method of claim 14 wherein said locking
5 mechanism comprises ratchets that engage with a gear coupled to the crankshaft.